

Effects of the North Carolina More at Four Pre-kindergarten on Children's School Readiness Skills

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The North Carolina More at Four Pre-kindergarten Program is a state-funded initiative for at-risk 4-year-olds, designed to help them be more successful when they enter elementary school. The purpose of More at Four is to provide a high quality, classroom-based educational program during the year prior to kindergarten entry. Over the years, 90% of the children served in More at Four have qualified for free or reduced-price lunch; eligibility for the program is also determined by other risk factors, including low English proficiency, identified disability, chronic health condition, and educational or developmental need. More at Four has provided a full school year pre-k program to over 167,000 children since it has been in operation (2002-2010).

Study Design

The purpose of the present study was to examine the effects of the More at Four Program on children's school readiness skills at entry into kindergarten. This study used a regression discontinuity design (RDD) to examine the effects of participation in More at Four on children's language/literacy and math skills. This design has been shown to provide the strongest evidence for treatment effects among quasi-experimental approaches.

This study took advantage of the age requirement for kindergarten by comparing two groups of children: the untreated group—children entering More at Four (who were not yet eligible for kindergarten), and the treated group—children who completed More at Four and were entering kindergarten. This provided a natural experiment for examining the effects of the More at Four Program. Because both groups of children were qualified for and selected to participate in More at Four, the two groups are equivalent on many important characteristics; the only difference is whether their birth date falls before or after the cut-off for kindergarten eligibility.

The study sample consisted of more than 1,000 children, including 501 pre-k children enrolled in More at Four in 2009-2010, and 509 kindergartners who

participated in More at Four the previous year in 2008-2009. Individual assessments of children's language/literacy skills (receptive vocabulary, phonological awareness, print knowledge, letter/word knowledge) and math skills (applied math problems, counting) were conducted near the beginning of the 2009-2010 school year. The analyses for this study examined whether there were differences in the skills of children in the treated and untreated groups as a result of participation in More at Four. Specifically, these analyses test whether there is a discontinuity, or difference, in the association between children's skill levels and their age when comparing children in the treated and untreated groups.

If a difference is found, it represents the effects of treatment, in this case, the effects of participation in the More at Four Program.

In addition, the analyses examined whether the effects of treatment are the same for different groups of children on the basis of poverty status (qualify for free, reduced-price, or full-price lunch), English language proficiency (non-, limited, or fluent English speaker), or cumulative risk (based on income, language proficiency, disability status, health condition, developmental/educational need), and also adjusted for children's race/ethnicity and gender.

The primary research questions addressed by this study were:

- Does participation in the More at Four Pre-k Program improve children's language/literacy and math school readiness skills?
- Are the effects of More at Four on school readiness skills similar for different groups of children on the basis of poverty status, English language proficiency, or cumulative risk?

Major Results

- Children who participated in More at Four had better language/literacy skills and math skills than children who had not participated.
 - The language/literacy skills of More at Four participants were higher for most skills that were measured, including letter/word knowledge, phonological awareness, and print knowledge. The one area with no differences was receptive vocabulary.
 - The math skills of More at Four participants were higher in both areas that were

measured, applied math problems and counting.

- There were generally large effects of More at Four participation on children's language/literacy skills and moderate to large effects on children's math skills, based on effect size calculations.
- The benefits of More at Four participation on children's language/literacy and math skills were similar for different groups of children.
 - Children at different levels of poverty showed similar gains in language/literacy (letter/word knowledge, phonological awareness, print knowledge) and math (applied math problems, counting) skills as a result of participation in More at Four.

- Children at different levels of English language proficiency showed similar gains in most language/literacy (letter/word knowledge, print knowledge) and math (applied math problems, counting) skills as a result of participation in More at Four. The one exception was that participation in More at Four had a stronger positive effect on phonological awareness skills for children with higher language proficiency than those with lower language proficiency.
- Children at different levels of cumulative risk showed similar gains in language/literacy (letter/word knowledge, phonological awareness, print knowledge) and math (applied math problems, counting) skills as a result of participation in More at Four.

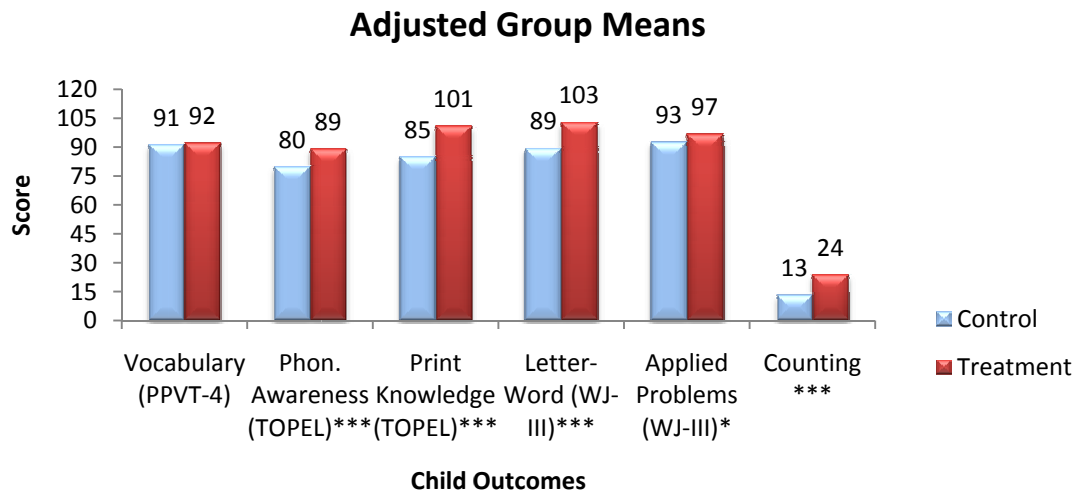


Table Notes:

Significance levels: * $p < .05$, *** $p < .001$.

Effect sizes (Cohen's d): Voc=.06, PA=.56, PK=1.16, L-W=1.14, AP=.34, Count=.81.

All measures use standard scores (mean=100, SD=15) except Counting (range=0-40).

Conclusions

These findings indicate that the More at Four Program has beneficial effects on children's language/literacy and math skills at entry into kindergarten. These effects were found across a number of different measures of language, literacy, and math, and were similar for different groups of children based on poverty status, English language proficiency, and cumulative risk. This study included over 1,000 children and used a rigorous regression discontinuity design. In sum, these results demonstrate that the More at Four Program is

achieving its primary goal of improving school readiness for at-risk children.

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